MTH603 - Numerical Analysis Solved final Term Papers For Final Term Exam

Exact solution of 2/3 is not exists.
TRUE
FALSE

The Jacobi's method is
A method of solving a matrix equation on a matrix that has ____ zeros along its main diagonal.

No
At least one

A 3 x 3 identity matrix have three and __________eigen values.
Same
Different

Eigenvalues of a symmetric matrix are all _______ .
Real
Complex
Zero
Positive

The Jacobi iteration converges, if A is strictly diagonally dominant.
TRUE
FALSE

Below are all the finite difference methods EXCEPT _________.

Jacobi's method
Newton's backward difference method
Stirlling formula
Forward difference method

If n x n matrices A and B are similar, then they have the same eigenvalues (with the same multiplicities).
TRUE
FALSE

If A is a nxn triangular matrix (upper triangular, lower triangular) or diagonal matrix, the eigenvalues of A are the diagonal entries of A.

TRUE
FALSE

The characteristics polynomial of a 3x 3
Identity matrix is __________, if x is the Eigen values of the given 3 x 3 identity matrix. Where symbol ^ shows power.

(X-1)^3
(x+1)^3
X^3-1
X^3+1

Two matrices with the same characteristic polynomial need not be similar.

TRUE
FALSE

Bisection method is a

Bracketing method
Open method

Regula Falsi means

Method of Correct position
Method of unknown position
Method of false position
Method of known position

Eigenvalues of a symmetric matrix are all _________.
Select correct option:

Real
Zero
Positive
Negative

An eigenvector V is said to be normalized if the coordinate of largest magnitude is equal to zero.
Select correct option:

TRUE
FALSE

Exact solution of 2/3 is not exists.
Select correct option:

TRUE
FALSE

The Gauss-Seidel method is applicable to strictly diagonally dominant or symmetric ________ definite matrices A.
Select correct option:

Positive
Negative

Differences methods find the ________ solution of the system.
Select correct option:

Numerical
Analytical

The Power method can be used only to find the eigenvalue of A that is largest in absolute value—we call this Eigenvalue the dominant eigenvalue of A.
Select correct option:

TRUE
FALSE

The Jacobi's method is a method of solving a matrix equation on a matrix that has no zeros along its ________.
Select correct option:

Main diagonal
Last column

Last row
First row

If A is a nxn triangular matrix (upper triangular, lower triangular) or diagonal matrix , the eigenvalues of A are the diagonal entries of A.
Select correct option:

TRUE
FALSE

A 3 x 3 identity matrix have three and different Eigen values.
Select correct option:

TRUE
FALSE

Newton Raphson method falls in the category of

Bracketing method
Open Method
Iterative Method
Indirect Method

Newton Raphson method is also known as
Tangent Method
Root method
Open Method
Iterative Method

Secant Method uses values for approximation

1
3
2
4

Secant Method is than bisection method for finding root
Slow
Faster

In Newton Raphson method

Root is bracketed
Root is not bracketed

Regula falsi method and bisection method are both

Convergent
Divergent

In bisection method the two points between which the root lies are

Similar to each other
Different
Not defined
Opposite

In which methods we do not need initial approximation to start
Indirect Method
Open Method
Direct Method
Iterative Method

Root may be

Complex
Real
Complex or real
None

In Regula falsi method we choose points that have signs

2 points opposite signs
3 points opposite signs
2 points similar signs
None of the given

In a bounded function values lie between
1 and -1
1 and 2
0 and 1
0 and -2

Newton Raphson method is a method which when it leads to division of number close to zero
Diverges

Converges

Which of the following method is modified form of Newton Raphson Method?
Regula falsi method
Bisection method
Secant method
Jacobi's Method

Which 1 of the following is generalization of Secant method?
Muller's Method
Jacobi's Method
Bisection Method
N-R Method

Secant Method needs starting points

2
3
4
1

Near a simple root Muller's Method converges than the secant method

Faster
Slower

If S is an identity matrix, then

$S^{-1} = S$
$S^{t} = S$
$S^{-1} = S^{t}$
All are true

If we retain r+1 terms in Newton's forward difference formula, we obtain a polynomial of degree ---- agreeing with y_x at $x_{0,} x_1, \ldots, x_r$

r+2
r+1
R
R-1

P in Newton's forward difference formula is defined as

$p = (\frac{x - x_0}{h})$

$p = (\frac{x + x_0}{h})$

$p = (\frac{x + x_n}{h})$

$p = (\frac{x - x_n}{h})$

Octal numbers has the base

10
2
8
16

Newton's divided difference interpolation formula is used when the values of the independent variable are

Equally spaced

Not equally spaced

Constant
None of the above

Given the following data

x	0	1	2	4
$f(x)$	1	1	2	5

Value of $f(2,4)$ is

1.5

3
2

1

If $y(x)$ is approximated by a polynomial $p_n(x)$ of degree n then the error is given by

$\varepsilon(x) = y(x) + P_n(x)$

$\varepsilon(x) = y(x) - P_n(x)$

$\varepsilon(x) = y(x) \times P_n(x)$

$\varepsilon(x) = P_n(x) + y(x)$

Let I denotes the closed interval spanned by $x_0, x_1, x_2, x_3, x_4, x_5, x_6, x_7, \overline{x}$. Then $F(x)$ vanishes ------times in the interval I.

N-1
N+2
N
N+1

Differential operator in terms of forward difference operator is given by

$$D = \frac{1}{h}(\Delta + \frac{\Delta^2}{2!} + \frac{\Delta^3}{3!} + \frac{\Delta^4}{4!} + \frac{\Delta^5}{5!} + ...)$$

$$D = \frac{1}{h}(\Delta + \frac{\Delta^2}{2} + \frac{\Delta^3}{3} + \frac{\Delta^4}{4} + \frac{\Delta^5}{5} + ...)$$

$$D = \frac{1}{h}(\Delta - \frac{\Delta^2}{2} + \frac{\Delta^3}{3} - \frac{\Delta^4}{4} + \frac{\Delta^5}{5} - ...)$$

$$D = \frac{1}{h}(\Delta - \frac{\Delta^2}{2!} + \frac{\Delta^3}{3!} - \frac{\Delta^4}{4!} + \frac{\Delta^5}{5!} - ...)$$

Finding the first derivative of $f(x)$ at x =0.4 from the following table:

x	0.1	0.2	0.3	0.4
$f(x)$	1.10517	1.22140	1.34986	1.49182

Differential operator in terms of ----------------will be used.

Forward difference operator
Backward difference operator
Central difference operator
All of the given choices

For the given table of values

x	0.1	0.2	0.3	0.4	0.5	0.6
$f(x)$	0.425	0.475	0.400	0.452	0.525	0.575

$f^{/}(0.1)$, using two-point equation will be calculated as............

-0.5
0.5
0.75
-0.75

In Simpson's 1/3 rule, $f(x)$ is of the form

$ax+b$
- ax^2+bx+c
- ax^3+bx^2+cx+d
- $ax^4+bx^3+cx^2+dx+e$

While integrating $I=\int_a^b f(x)dx$ **,** h **, width of the interval, is found by the formula------**

$\frac{b-a}{n}$

$\frac{b+a}{n}$

$\frac{a-b}{n}$

None of the given choices

To apply Simpson's 1/3 rule, valid number of intervals are.....

7
8
5
3

For the given table of values

x	0.1	0.2	0.3	0.4	0.5	0.6
$f(x)$	0.425	0.475	0.400	0.452	0.525	0.575

$f^{//}(0.2)$ **, using three-point equation will be calculated as ……**

17.5
12.5
7.5
-12.5

To apply Simpson's 1/3 rule, the number of intervals in the following must be

2
3
5
7

To apply Simpson's 3/8 rule, the number of intervals in the following must be

10
11
12
13

If the root of the given equation lies between a and b, then the first approximation to the root of the equation by bisection method is ……

$\frac{(a+b)}{2}$
$\frac{(a-b)}{2}$
$\frac{(b-a)}{2}$
None of the given choices

............lies in the category of iterative method.

Bisection Method
Regula Falsi Method
Secant Method
All of the given choices

For the equation $x^3+3x-1=0$, the root of the equation lies in the interval......

(1, 3)
(1, 2)
(0, 1)
(1, 2)

Rate of change of any quantity with respect to another can be modeled by

An ordinary differential equation
A partial differential equation

A polynomial equation

None of the given choices

If

$$\frac{dy}{dx} = f(x,y)$$

Then the integral of this equation is a curve in

None of the given choices

Xt-plane
Yt-plane
Xy-plane

In solving the differential equation

$$y^{/} = x + y \; ; \; y(0.1) = 1.1$$

$h = 0.1$**, By Euler's method** $y(0.2)$ **is calculated as**

1.44
1.11
1.22
1.33

In second order Runge-Kutta method k_1 is given by

$k_1 = hf(x_n, y_n)$

$k_1 = 2hf(x_n, y_n)$

$k_1 = 3hf(x_n, y_n)$

None of the given choices

In fourth order Runge-Kutta method, k_2 is given by

$k_2 = hf(x_n + \frac{h}{2}, y_n + \frac{k_1}{2})$

$k_2 = hf(x_n + \frac{h}{3}, y_n + \frac{k_1}{3})$

$k_2 = hf(x_n - \frac{h}{3}, y_n - \frac{k_1}{3})$

$k_2 = hf(x_n - \frac{h}{2}, y_n - \frac{k_1}{2})$

In fourth order Runge-Kutta method, k_4 is given by

$k_3 = hf(x_n + 2h, y_n + 2k_3)$

$k_3 = hf(x_n - h, y_n - k_3)$

$k_3 = hf(x_n + h, y_n + k_3)$

None of the given choices

Adam-Moulton P-C method is derived by employing

Newton's backward difference interpolation formula
Newton's forward difference interpolation formula
Newton's divided difference interpolation formula
None of the given choices

The need of numerical integration arises for evaluating the definite integral of a function that has no explicit ____________ or whose antiderivative is not easy to obtain

Derivatives
Antiderivative

If $|A| \neq 0$ then system will have a

Definite solution
Unique solution
Correct solution
No solution

If $|A| = 0$ then

There is a unique solution
There exists a complete solution
There exists no solution
None of the above options

Direct method consists of method
2
3
5
4
We consider Jacobi's method Gauss Seidel Method and relaxation method as
Direct method
Iterative method
Open method
All of the above

In Gauss Elimination method Solution of equation is obtained in
3 stages
2 stages
4 stages
5 stages

Gauss Elimination method fails if any one of the pivot values becomes
Greater
Small
Zero
None of the given

Changing the order of the equation is known as

Pivoting
Interpretation

Full pivoting is than partial pivoting
Easy
More complicated

The following is the variation of Gauss Elimination method

Jacobi's method
Gauss Jordan Elimination method

Courts reduction method is also known as Cholesky Reduction method
True

False

Jacobi's method is also known as method of Simultaneous displacement
True
False
Gauss Seidel method is also known as method of Successive displacement
False
True
In Jacobi's method approximation calculated is used for
Nothing
Calculating the next approximation
Replaced by previous one
All above

In Gauss Seidel method approximation calculated is replaced by previous one
True
False

Relaxation method is derived by
South well
Not defined

Power method is applicable for only
Real metrics
Symmetric
Unsymmetrical
Both symmetric and real

The process of eliminating value of y for intermediate value of x is know as interpolation
True
False

Question : While solving a system of linear equations, which of the following approach is economical for the computer memory?
Select correct option:
Direct
Iterative
Analytical
Graphical

Question : The basic idea of relaxation method is to reduce the largest residual to …………

Select correct option:

One
Two
Zero
None of the given choices

Question: The Jacobi's method is a method of solving a matrix equation on a matrix that has no zeros along its ________.

Select correct option:

main diagonal
last column
last row
first row

Question: If A is a nxn triangular matrix (upper triangular, lower triangular) or diagonal matrix ,
the eigenvalues of A are the diagonal entries of A.

Select correct option:

TRUE
FALSE

Question : A 3 x 3 identity matrix have three and different eigen values.

Select correct option:

TRUE
FALSE

Question : Which of the following is a reason due to which the LU decomposition of the system of linear equations; x+y = 1, x+y =2 is not possible?

Select correct option:

Associated coefficient matrix is singular
All values of l's and u's can't be evaluated
Determinant of coefficient matrix is zero
All are equivalent

Question : Gauss - Jordan Method is similar to ……….

Select correct option:

Gauss–Seidel method
Iteration's method
Relaxation Method
Gaussian elimination method

Question : While using Relaxation method, which of the following is the largest Residual for 1st iteration on the system; 2x+3y = 1, 3x +2y = - 4 ?
Select correct option:

-4
3
2
1

Question : Gauss–Seidel method is also known as method of ……………
Select correct option:

Successive displacement
Iterations
False position
None of the given choices

Question : Jacobi's Method is a/an………………
Select correct option:

Iterative method
Direct method

Question : The characteristics polynomial of a 3x 3 identity matrix is __________, if x is the eigen values of the given 3 x 3 identity matrix. where symbol ^ shows power.
Select correct option:
(x-1)^3
(x+1)^3
x^3-1
x^3+1

Question : The Power method can be used only to find the eigenvalue of A that is largest in absolute value—we call this eigenvalue the dominant eigenvalue of A.
Select correct option:

TRUE
FALSE

Question: In …………… method, a system is reduced to an equivalent diagonal form using elementary transformations.
Select correct option:
Jacobi's
Gauss-Seidel
Relaxation
Gaussian elimination

Question : The linear equation: 2x+0y-2=0 has -------- solution/solutions.
Select correct option:

unique
no solution
infinite many
finite many

Question : Under elimination methods, we consider, Gaussian elimination and ……………methods.
Select correct option:

Gauss-Seidel
Jacobi
Gauss-Jordan elimination
None of the given choices

Question : Which of the following method is not an iterative method?
Select correct option:

Jacobi's method
Gauss-Seidel method
Relaxation methods
Gauss-Jordan elimination method

Question : An eigenvector V is said to be normalized if the coordinate of largest magnitude is equal to zero.

Select correct option:
TRUE
FALSE

Question : Exact solution of 2/3 is not exists.
Select correct option:
TRUE

FALSE

Question : When the condition of diagonal dominance becomes true in Jacobi's Method.Then its means that the method is …………….
Select correct option:

Stable
Unstable
Convergent
Divergent

Question : Gauss–Seidel method is similar to ……….
Select correct option:

Iteration's method
Regula-Falsi method
Jacobi's method
None of the given choices

Question : Sparse matrices arise in computing the numerical solution of …………….
Select correct option:

Ordinary differential equations
Partial differential equations
Linear differential equations
Non-linear differential equations

Question : While solving by Gauss-Seidel method, which of the following is the first Iterative solution for the system; x-2y =1, x+4y=4 ?
Select correct option:

(1, 0.75)
(0,0)
(1,0)
(0,1)

Question: While solving a system of linear equations by Gauss Jordon Method, after all the elementary row operations if there lefts also zeros on the main diagonal then which of the is true about the system?
Select correct option:

System may have unique solutions
System has no solution
System may have multiple numbers of finite solutions
System may have infinite many solutions

Question: Numerical methods for finding the solution of the system of equations are classified as direct and ………… methods
Select correct option:

Indirect
Iterative
Jacobi
None of the given choices

Question : If the Relaxation method is applied on the system; 2x+3y = 1, 3x +2y = - 4, then largest residual in 1st iteration will reduce to -------.
Select correct option:
zero
4
-1
-1

Question : While using Relaxation method, which of the following is the Residuals for 1st iteration on the system; 2x+3y = 1, 3x +2y =4 ?
Select correct option:
(2,3)
(3,-2)
(-2,3)
(1,4)

Question : If the order of coefficient matrix corresponding to system of linear equations is 3*3 then which of the following will be the orders of its decomposed matrices; 'L' and 'U'?
Select correct option:
Order of 'L' = 3*1, Order of 'U' = 1*3
Order of 'L' = 3*2, Order of 'U' = 2*3
Order of 'L' = 3*3, Order of 'U' = 3*3
Order of 'L' = 3*4, Order of 'U' = 4*3

Question : While solving the system; x–2y = 1, x+4y = 4 by Gauss-Seidel method, which of the following ordering is feasible to have good approximate solution?
Select correct option:
x+4y = 1, x-2y = 4
x+2y = 1, x- 4y =4
x+4y = 4, x–2y = 1
no need to reordering

Question : Full pivoting, in fact, is more ……………than the partial pivoting.
Select correct option:

Easiest
Complicated

Question : Gauss–Seidel method is also known as method of …………….
Select correct option:
Successive displacement
Iterations
False position
None of the given choices

Question : For the equation $x^3+3x-1=0$, the root of the equation lies in the interval......

- ► (1, 3)
- ► (1, 2)
- ► (0, 1)
- ► (1, 2)

Question :-...........lies in the category of iterative method.

- ► Bisection Method
- ► Regula Falsi Method
- ► Secant Method
- ► all of the given choices

Question : Power method is applicable if the eigen vectors corresponding to eigen values are
linearly independent.
True
1. false

Question: A 3 x 3 identity matrix have three and different eigen values.
1. True
False
Question : If n x n matrices A and B are similar, then they have the different eigenvalues (with the same multiplicities).
1. True
False
Question : The Jacobi's method is a method of solving a matrix equation on a matrix that has ____zeros along its main diagonal.
No
1. At least one
Question : An eigenvector V is said to be normalized if the coordinate of largest magnitude is

equal to ______.
Unity
1. zero

Question : If the root of the given equation lies between a and b, then the first approximation to the root of the equation by bisection method is ……

- $\frac{(a+b)}{2}$
- $\frac{(a-b)}{2}$
- $\frac{(b-a)}{2}$
- None of the given choices

Question : To apply Simpson's 3/8 rule, the number of intervals in the following must be

- 10
- 11
- 12
- 13

Question : The Gauss-Seidel method is applicable to strictly diagonally dominant or symmetric________ definite matrices A.
Select correct option:
positive
negative
Question : Differences methods find the ________ solution of the system.
Select correct option:
numerical
Analytical

Question : To apply Simpson's 1/3 rule, the number of intervals in the following must be

- ► 2 (**Simpson**''s **1/3 rule must use** an even **number** of elements')
- ► 3
- ► 5
- ► 7

Question : The Power method can be used only to find the eigenvalue of A that is largest in absolute value we call this eigenvalue the dominant eigenvalue of A.
Select correct option:

TRUE
FALSE

Question : The Jacobi's method is a method of solving a matrix equation on a matrix that has no zeros along its ________.
Select correct option:

main diagonal
last column
last row
first row

Question : Bisection and false position methods are also known as bracketing method and are
always
Divergent
Convergent

Question : The Inverse of a matrix can only be found if the matrix is
Singular
Every square non-singular matrix will have an inverse.
Scalar
Diagonal
Question : In interpolation is used to represent the δ

Forward difference
Central difference
Backward difference

Question : The base of the decimal system is _______
10
0
2
8
None of the above.

Question : Bisection method is ………………. method
► Open Method
► **Bracketing Method**
Question : Exact solution of 2/3 is not exists.
TRUE
FALSE
Question : The Jacobi's method is a method of solving a matrix equation on a matrix that has ____zeros along its main diagonal.
No
atleast one

Question: A 3 x 3 identity matrix have three and __________eigen values.
same
different
Question : Eigenvalues of a symmetric matrix are all _______ .
real
complex
zero
positive
Question : The Jacobi iteration converges, if A is strictly diagonally dominant.
TRUE
FALSE
Question : Below are all the finite difference methods EXCEPT _________.

jacobi's method
newton's backward difference method
Stirlling formula
Forward difference method
Question: If n x n matrices A and B are similar, then they have the same eigenvalues (with the same multiplicities).
TRUE
FALSE
Question : If A is a nxn triangular matrix (upper triangular, lower triangular) or diagonal matrix , the eigenvalues of A are the diagonal entries of A.
TRUE
FALSE
Question: The characteristics polynomial of a 3x 3 identity matrix is __________, if x is the eigen values of the given 3 x 3 identity matrix. where symbol ^ shows power.
(x-1)^3
(x+1)^3
x^3-1
x^3+1
Question : Two matrices with the same characteristic polynomial need not be similar.
TRUE
FALSE

Question : The determinant of a diagonal matrix is the product of the diagonal elements.
True
1. False
Qusetion : The Gauss-Seidel method is applicable to strictly diagonally dominant or symmetric
positive definite matrices A.
True
1. False
Question : The determinant of a _______ matrix is the product of the diagonal elements.

Diagonal

1. Upper triangular
2. Lower triangular
3. Scalar

Question : For differences methods we require the set of values.
True
False

Question : If x is an eigen value corresponding to eigen value of V of a matrix A. If a is any constant, then x – a is an eigen value corresponding to eigen vector V is an of the matrix A - a I.
True
False

Question : Central difference method seems to be giving a better approximation, however it requires more computations.

True
False

Question : Iterative algorithms can be more rapid than direct methods.
True
1. False

Question : Central Difference method is the finite difference method.
True
1. False

Question : Back substitution procedure is used in …………….
Select correct option:
Gaussian Elimination Method
Jacobi's method
Gauss-Seidel method
None of the given choices

Question : The Jacobi's method is a method of solving a matrix equation on a matrix that has no zeros along its main diagonal.

True
False1 .

Question: The Jacobi's method is a method of solving a matrix equation on a matrix that has no zeros along its ________.
•
main diagonal
last column
last row
first row
Question : .An eigenvector V is said to be normalized if the coordinate of largest magnitude is equal to ______.
Unity
Zero
Question : An eigenvector V is said to be normalized if the coordinate of largest magnitude is equal to zero.

TRUE
FALSE
Question : .The Gauss-Seidel method is applicable to strictly diagonally dominant or symmetric positive definite matrices A.

True
False

Question : The Gauss-Seidel method is applicable to strictly diagonally dominant or symmetricdefinite matrices A.

Pos I t ive
Negative
Question : .The determinant of a diagonal matrix is the product of the diagonal elements.

True
False1
Question : Power method is applicable if the eigen vectors corresponding to eigen values are linearlyindependent.

True

False

Question : Power method is applicable if the eigen values are ______________.

real and distinct
real and equal
positive and distinct
negative and distinct

Question : Simpson's rule is a numerical method that approximates the value of a definite integral by using polynomials.

Quadratic
Linear
Cubic
Quartic

Question : .In Simpson's Rule, we use parabolas to approximating each part of the curve. This proves to be very efficient as compared to Trapezoidal rule.

True
False

Question : The predictor-corrector method an implicit method. (multi-step methods)

True
False

Question : Generally, Adams methods are superior if output at many points is needed.

True
False

Question : The Trapezoidal rule is a numerical method that approximates the value of a.______________.

Indefinite integral
Definite integral
Improper integral

Function

Question : The need of numerical integration arises for evaluating the definite integral of a functionthat has no explicit ____________ or whose antiderivative is not easy to obtain.

Anti deri vat ive

Derivatives.

Question : .An indefinite integral may _________ in the sense that the limit defining it may not exist.

diverge

Converge

Question : An improper integral is the limit of a definite integral as an endpoint of the interval of integration approaches either a specified real number or ∞ or $-\infty$ or, in some cases, as both endpoints approach limits.

TRUE

FALSE

Question : Euler's Method numerically computes the approximate derivative of a function.

TRUE

FALSE

Question :.Euler's Method numerically computes the approximate ________ of a function.

Antiderivative

Derivative

Error

Value

Question: If we wanted to find the value of a definite integral with an infinite limit, we can insteadreplace the infinite limit with a variable, and then take the limit as this variable goes to _________.

Chose the correct option :

Constant

Finite

Infinity

Zero

Question : Euler's Method numerically computes the approximate derivative of a function.

- TRUE
- FALSE

Question: .The Jacobi iteration ______, if A is strictly diagonally dominant.

converges
Diverges
Question :. Two matrices with the same characteristic polynomial need not be similar.

TRUE
fALSE
Question :. Differences methods find the ________ solution of the system.
Nu me rical
Analytica
Question : .By using determinants, we can easily check that the solution of the given system of linear equation exits and it is unique.

TRUE
FALSE
Question : The absolute value of a determinant (|detA|) is the product of the absolute values of theeigenvalues of matrix A

TRUE
FALSE

Question : Eigenvectors of a symmetric matrix are orthogonal, but only for distinct eigenvalues.

TRUE

FALSE

.

Question : Let A be an n ×n matrix. The number x is an eigenvalue of A if there exists a non-zerovector v such that _______.

Av = xv

Ax = xv not shore

Av + xv=0

Av = Ax1

Question : In Jacobi's Method, the rate of convergence is quite ______ compared with other methods.

slow

Fast

Question : .Numerical solution of 2/3 up to four decimal places is ________.

0.667

0.6666

0.6667

0.666671 .

Question : Symbol used for forward differences is

Δ Correct

δ

μ

Question : .The relationship between central difference operator and the shift operator is given by

$\delta = E - E^{-1}$

$\delta = E + E^{-1}$

$\delta = E^{1/2} + E^{1/2}$

$\delta = E^{1/2} - E^{1/2}$

Question : Muller's method requires --------starting points

1

2

3

Question : By using determinants, we can easily check that the solution of the given system of linear equation ______ and it is ______.

Select correct option:
exits, unique
exists, consistent
trivial, unique
nontrivial, inconsistent

Question : Two matrices with the _______ characteristic polynomial need not be similar.

Select correct option:
same
different

Question : In ……………… method, the elements above and below the diagonal are simultaneously made zero.

Select correct option:
Jacobi's
Gauss-Seidel
Gauss–Jordon Elimination
Relaxation

Question : Which of the following is equivalent form of the system of equations in matrix form; AX=B ?

Select correct option:
XA = B
X = B(Inverse of A)
X =(Inverse of A)B
BX = A

Question : If the determinant of a matrix A is not equal to zero then the system of equations will have……….

Select correct option:
a unique solution
many solutions
infinite many solutions
None of the given choices

Question : Sparse matrix is a matrix with ……….

Select correct option:
Some elements are zero
Many elements are zero
Some elements are one
Many elements are one

Question : An eigenvector V is said to be normalized if the coordinate of largest magnitude is equal to zero.

Select correct option:

TRUE

FALSE

Question : While solving a system of linear equations, which of the following approach is economical for the computer memory?
Select correct option:

- Direct
- Iterative
- Analytical
- Graphical

Question: The basic idea of relaxation method is to reduce the largest residual to …………
Select correct option:

- One
- Two
- Zero
- None of the given choices

Question: The Jacobi's method is a method of solving a matrix equation on a matrix that has no zeros along its ________.
Select correct option:
main diagonal
last column
last row
first row

Question: If A is a nxn triangular matrix (upper triangular, lower triangular) or diagonal matrix ,
the eigen values of A are the diagonal entries of A.
Select correct option:
TRUE
FALSE

Question : A 3 x 3 identity matrix have three and different eigen values.
Select correct option:
TRUE
FALSE

Question : Which of the following is a reason due to which the LU decomposition of the system of linear equations; x+y = 1, x+y =2 is not possible?
Select correct option:

Associated coefficient matrix is singular
All values of l's and u's can't be evaluated
Determinant of coefficient matrix is zero
All are equivalent

Question : Gauss - Jordan Method is similar to ……….
Select correct option:

Gauss–Seidel method
Iteration's method
Relaxation Method
Gaussian elimination method

Question : While using Relaxation method, which of the following is the largest Residual for 1st iteration on the system; 2x+3y = 1, 3x +2y = - 4 ?
Select correct option:

-4
3
2
1

Question : Gauss–Seidel method is also known as method of …………….
Select correct option:

Successive displacement
Iterations
False position
None of the given choices

Question : Jacobi's Method is a/an………………
Select correct option:

Iterative method
Direct method

Question : The characteristics polynomial of a 3x 3 identity matrix is __________, if x is the eigen values of the given 3 x 3 identity matrix. where symbol ^ shows power.
Select correct option:

(x-1)^3
(x+1)^3
x^3-1
x^3+1

Question : The Power method can be used only to find the eigenvalue of A that is largest in absolute value—we call this eigenvalue the dominant eigenvalue of A.
Select correct option:
TRUE
FALSE

Question: In …………… method, a system is reduced to an equivalent diagonal form using elementary transformations.
Select correct option:
Jacobi’s
Gauss-Seidel
Relaxation
Gaussian elimination

Question : The linear equation: 2x+0y-2=0 has -------- solution/solutions.
Select correct option:
unique
no solution
infinite many
finite many

Question : Under elimination methods, we consider, Gaussian elimination and ……………methods.
Select correct option:
Gauss-Seidel
Jacobi
Gauss-Jordan elimination
None of the given choices

Question : Which of the following method is not an iterative method?
Select correct option:
Jacobi’s method

Gauss-Seidel method
Relaxation methods
Gauss-Jordan elimination method

Question : An eigenvector V is said to be normalized if the coordinate of largest magnitude is equal to zero.
Select correct option:
TRUE
FALSE

Question : Exact solution of 2/3 is not exists.
Select correct option:
TRUE
FALSE

Question : When the condition of diagonal dominance becomes true in Jacobi's Method. Then its means that the method is …………….
Select correct option:

Stable
Unstable
Convergent
Divergent

Question : Gauss–Seidel method is similar to ……….
Select correct option:

Iteration's method
Regula-Falsi method
Jacobi's method
None of the given choices

Question : Sparse matrices arise in computing the numerical solution of …………….
Select correct option:

Ordinary differential equations
Partial differential equations

Linear differential equations
Non-linear differential equations

Question : While solving by Gauss-Seidel method, which of the following is the first Iterative solution for the system; x-2y =1, x+4y=4 ?
Select correct option:

(1, 0.75)
(0,0)
(1,0)
(0,1)

Question: While solving a system of linear equations by Gauss Jordon Method, after all the elementary row operations if there lefts also zeros on the main diagonal then which of the is true about the system?
Select correct option:

System may have unique solutions
System has no solution
System may have multiple numbers of finite solutions
System may have infinite many solutions

Question: Numerical methods for finding the solution of the system of equations are classified as direct and ………… methods
Select correct option:

Indirect
Iterative
Jacobi
None of the given choices

Question : If the Relaxation method is applied on the system; 2x+3y = 1, 3x +2y = - 4, then largest residual in 1st iteration will reduce to -------.
Select correct option:
zero
4
-1
-1

Question : While using Relaxation method, which of the following is the Residuals for 1st iteration on the system; 2x+3y = 1, 3x +2y =4 ?
Select correct option:
(2,3)
(3,-2)
(-2,3)
(1,4)
Question : If the order of coefficient matrix corresponding to system of linear equations is 3*3 then which of the following will be the orders of its decomposed matrices; ‘L’ and ‘U’?
Select correct option:
Order of ‘L’ = 3*1, Order of ‘U’ = 1*3
Order of ‘L’ = 3*2, Order of ‘U’ = 2*3
Order of ‘L’ = 3*3, Order of ‘U’ = 3*3
Order of ‘L’ = 3*4, Order of ‘U’ = 4*3

Question : While solving the system; x–2y = 1, x+4y = 4 by Gauss-Seidel method, which of the following ordering is feasible to have good approximate solution?
Select correct option:
x+4y = 1, x-2y = 4
x+2y = 1, x- 4y =4
x+4y = 4, x–2y = 1
no need to reordering

Question : Full pivoting, in fact, is more ……………than the partial pivoting.
Select correct option:
Easiest
Complicated

Question : Gauss–Seidel method is also known as method of …………….
Select correct option:
Successive displacement
Iterations
False position
None of the given choices

Question : For the equation $x^3 + 3x - 1 = 0$, the root of the equation lies in the interval......

- ► (1, 3)
- ► (1, 2)
- ► (0, 1)
- ► (1, 2)

Question :-...........lies in the category of iterative method.

- ► Bisection Method
- ► Regula Falsi Method
- ► Secant Method
- ► all of the given choices

Question : Power method is applicable if the eigen vectors corresponding to eigen values are linearly independent.
True
1. false

Question: A 3 x 3 identity matrix have three and different eigen values.
1. True
False
Question : If n x n matrices A and B are similar, then they have the different eigenvalues (with the same multiplicities).
1. True
False
Question : The Jacobi's method is a method of solving a matrix equation on a matrix that has ____zeros along its main diagonal.
No
1. At least one
Question : An eigenvector V is said to be normalized if the coordinate of largest magnitude is
equal to ______.
Unity
1. zero

Question : If the root of the given equation lies between a and b, then the first approximation to the root of the equation by bisection method is ……

- ► $\frac{(a+b)}{2}$
- ► $\frac{(a-b)}{2}$
- ► $\frac{(b-a)}{2}$
- ► None of the given choices

Question : To apply Simpson's 3/8 rule, the number of intervals in the following must be

- ► 10
- ► 11
- ► 12
- ► 13

Question : The Gauss-Seidel method is applicable to strictly diagonally dominant or symmetric________ definite matrices A.
Select correct option:
positive
negative
Question : Differences methods find the ________ solution of the system.
Select correct option:
numerical
Analytical
Question : To apply Simpson's 1/3 rule, the number of intervals in the following must be

- ► 2 (**Simpson**"s **1/3 rule must use** an even **number** of elements')
- ► 3
- ► 5
- ► 7

Question: Bisection and false position methods are also known as bracketing method and are always
Divergent
Convergent

Question : The Inverse of a matrix can only be found if the matrix is
Singular
Every square non-singular matrix will have an inverse.
Scalar
Diagonal

Question : In interpolation is used to represent the δ
Forward difference
Central difference
Backward difference

Question : The base of the decimal system is _______
10
0
2
8
None of the above.

Question : Bisection method is .... method
► Open Method
► **Bracketing Method**

Question: A 3 x 3 identity matrix have three and _______ eigen values.
same
different

Question : Eigenvalues of a symmetric matrix are all _______ .
real
complex
zero
positive

Question : Below are all the finite difference methods EXCEPT _________.
jacobi's method
newton's backward difference method
Stirlling formula
Forward difference method

Question: If n x n matrices A and B are similar, then they have the same eigenvalues (with the same multiplicities).
TRUE
FALSE

Question : If A is a nxn triangular matrix (upper triangular, lower triangular) or diagonal matrix , the eigenvalues of A are the diagonal entries of A.
TRUE
FALSE

Question : Two matrices with the same characteristic polynomial need not be similar.
TRUE
FALSE

Question : The determinant of a diagonal matrix is the product of the diagonal elements.
True
1. False

Question : For differences methods we require the set of values.
True
False

Question : If x is an eigen value corresponding to eigen value of V of a matrix A. If a is any constant, then x – a is an eigen value corresponding to eigen vector V is an of the matrix A - a I.
True
False

Question : Central difference method seems to be giving a better approximation, however it requires more computations.
True
False

Question : Iterative algorithms can be more rapid than direct methods.
True
1. False

Question : Central Difference method is the finite difference method.
True
1. False

Question : Back substitution procedure is used in **...............**
Select correct option:
Gaussian Elimination Method
Jacobi's method
Gauss-Seidel method
None of the given choices

Question : The Gauss-Seidel method is applicable to strictly diagonally dominant or symmetric _____ definite matrices A.

Pos I t ive
Negative

Question : Power method is applicable if the eigen values are __________.

real and distinct
real and equal
positive and distinct
negative and distinct

Question : Euler's Method numerically computes the approximate derivative of a function.

TRUE
FALSE

Question :.Euler's Method numerically computes the approximate _________ of a function.

Antiderivative
Derivative
Error
Value

Question: .The Jacobi iteration ______, if A is strictly diagonally dominant.

converges
Diverges

Question :.By using determinants, we can easily check that the solution of the given system of linear equation exits and it is unique.

TRUE
FALSE

Question : The absolute value of a determinant (|detA|) is the product of the absolute values of the eigen values of matrix A

TRUE
FALSE

Question : Eigenvectors of a symmetric matrix are orthogonal, but only for distinct eigenvalues.

TRUE
FALSE
.
Question : Let A be an n ×n matrix. The number x is an eigenvalue of A if there exists a non-zerovector v such that _______.

Av = xv
Ax = xv
Av + xv=0
Av = Ax1

Question : In Jacobi's Method, the rate of convergence is quite ______ compared with other methods.

slow
Fast

Question : .Numerical solution of 2/3 up to four decimal places is _________.

0.667
0.6666
0.6667
0.666671 .

Question : Symbol used for forward differences is

Δ
δ
µ

Question : .The relationship between central difference operator and the shift operator is given by

$\delta = E - E^{-1}$
$\delta = E + E^{-1}$
$\delta = E^{1/2} + E^{1/2}$
$\delta = E^{1/2} - E^{1/2}$

Question : Muller's method requires --------starting points

1
2

3

Question : By using determinants, we can easily check that the solution of the given system of linear equation ______ and it is ______.

Select correct option:
exits, unique
exists, consistent
trivial, unique
nontrivial, inconsistent

Question : Two matrices with the _______ characteristic polynomial need not be similar.

Select correct option:
same
different

Question : In ……………… method, the elements above and below the diagonal are simultaneously made zero.

Select correct option:
Jacobi's
Gauss-Seidel
Gauss–Jordon Elimination
Relaxation

Question : Which of the following is equivalent form of the system of equations in matrix form; AX=B ?

Select correct option:
XA = B
X = B(Inverse of A)
X =(Inverse of A)B
BX = A

Question : If the determinant of a matrix A is not equal to zero then the system of equations will have……….

Select correct option:
a unique solution
many solutions
infinite many solutions
None of the given choices

Question : Sparse matrix is a matrix with ……….

Select correct option:
Some elements are zero
Many elements are zero
Some elements are one
Many elements are one

Regula Falsi means
Method of Correct position
Method of unknown position
Method of false position
Method of known position

Newton Raphson method falls in the category of
Bracketing method
Open Method
Iterative Method
Indirect Method

Newton Raphson method is also known as
Tangent Method
Root method
Open Method
Iterative Method

Secant Method uses values for approximation
1
3
2
4
Secant Method is ______ than bisection method for finding root
Slow

Faster

In Newton Raphson method
Root is bracketed
Root is not bracketed

Regula falsi method and bisection method are both
Convergent
Divergent

In bisection method the two points between which the root lies are
Similar to each other
Different
Not defined
Opposite

In which methods we do not need initial approximation to start
Indirect Method
Open Method
Direct Method
Iterative Method

Root may be
Complex
Real
Complex or real
None

In Regula falsi method we choose points that have signs
2 points opposite signs
3 points opposite signs
2 points similar signs
None of the given

In a bounded function values lie between
1 and -1
1 and 2
0 and 1
0 and -2

Newton Raphson method is a method which when it leads to division of number close to zero
Diverges
Converges

Which of the following method is modified form of Newton Raphson Method?
Regula falsi method
Bisection method
Secant method
Jacobi's Method

Which 1 of the following is generalization of Secant method?
Muller's Method
Jacobi's Method
Bisection Method
N-R Method

If S is an identity matrix, then
S-1 = *S*
St = *S*
S-1 = *St*
All are true

Rate of change of any quantity with respect to another can be modeled by
An ordinary differential equation
A partial differential equation
A polynomial equation
None of the given choices

Direct method consists of method
2
3
5
4

We consider Jacobi's method Gauss Seidel Method and relaxation method as
Direct method
Iterative method
Open method

All of the above

In Gauss Elimination method Solution of equation is obtained in
3 stages
2 stages
4 stages
5 stages

Gauss Elimination method fails if any one of the pivot values becomes
Greater
Small
Zero
None of the given

Changing the order of the equation is known as
Pivoting
Interpretation

Courts reduction method is also known as Cholesky Reduction method
True
False

Jacobi's method is also known as method of Simultaneous displacement
True
False

Gauss Seidel method is also known as method of Successive displacement
False
True

In Jacobi's method approximation calculated is used for ______
Nothing
Calculating the next approximation
Replaced by previous one
All above

In Gauss Seidel method approximation calculated is replaced by previous one
True
False

Relaxation method is derived by
South well
Not defined

Power method is applicable for only
Real metrics
Symmetric
Unsymmetrical
Both symmetric and real

The process of eliminating value of y for intermediate value of x is know as interpolation
True
False

If system of equations is inconsistent then its means that it has ………
For the system of equations; x =2, y=3. The inverse of the matrix associated with its coefficients is-----------.

By using determinants, we can easily check that the solution of the given system of linear equation exits and it is unique.

TRUE
FALSE

For a function; y=f(x), if y0, y1 and y2 are 2,3 and 5 respectively then which of the following will be 2nd order Leading difference at y0 = 2 ?

1
-1
2
-2